PROCEEDINGS OF SCIENCE

Constraining the properties of new gamma-ray MSPs with distance and velocity measurements

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The millisecond pulsar (MSP) luminosity distribution is useful to address e.g. contributions to the distribution of the diffuse positrons and gamma rays within our Galaxy. Gamma-ray luminosity versus spin-down power ($\dot{E}$) is also a key observable to constrain emission models. The Shklovskii effect consists of an artificial increase of the apparent period derivative value ($\dot{P}$) over the intrinsic one due to the pulsar's transverse motion. Accounting for this effect can significantly change the $\dot{E}$ value in many cases: it depends on the MSP's distance and proper motion. In this contribution we will focus on the gamma-ray detection of four MSPs with the Fermi Large Area Telescope (LAT) and on parallax and proper motion measurements for an ensemble of gamma-ray MSPs using Nançay radio telescope data, that we use to compute the Shklovskii corrections and update the luminosity vs $\dot{E}$ relation, bringing new constraints on these pulsars' properties.

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